

REMARKS

The Examiner is thanked for the performance of a thorough search.

In the specification, paragraphs [0020] and [0026] are amended to correct clerical errors. Specifically, “service execution adapter 101” is changed to “service execution adapter 102” to be consistent with the drawings and the remainder of the specification. Thus, no new matter is introduced in the application by these amendments to the specification.

Prior to this response, Claims 1-33 were pending in the application. New Claims 34 and 35 are added and no claims are canceled. Hence, Claims 1-35 are pending in the application upon entry of this response.

Claims 1, 11, 21 and 33 are amended herein.

SUMMARY OF THE REJECTIONS/OBJECTIONS

Claims 1-33 were rejected under 35 U.S.C. §101 as allegedly directed to non-statutory subject matter;

Claims 1, 3-5, 7, 8, 10, 11, 13-15, 17, 18, 20, 21, 26, 28, 30 and 32 were rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over Devine et al. (“*Devine*”; U.S. Patent Application Publication No. 2002/0095399);

Claims 2, 9, 12, 19, 22 and 31 were rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over *Devine* in view of Grau (“*Grau*”; “Analyzing object specification for execution”;

Claims 6, 16, 23-25, 27 and 29 were rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over *Devine* in view of Meltzer et al. (“*Meltzer*”; U.S. Patent No. 6,542,912); and

Claim 33 was rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over *Devine* in view of *Grau* further in view of *Meltzer*.

THE REJECTIONS BASED ON THE PRIOR ART

Rejections under 35 U.S.C. §101

Claims 1-33 were rejected under 35 U.S.C. §101 as allegedly directed to non-statutory subject matter.

(I) Claims 1-10 and 33

Claims 1-10 and 33 were rejected as method claims not tied to use of hardware to accomplish the recited steps. Claims 1 and 33 are amended herein to recite “the computer-implemented steps of...” Hence, the recited steps are now explicitly computer-implemented and, therefore, this rejection is overcome. Reconsideration and withdrawal of the rejection of Claims 1-10 and 33 under 35 U.S.C. § 101 is requested.

(II) Claims 11-22

Claims 11-22 were rejected as computer-readable medium claims that allegedly are not limited to tangible mediums because computer-readable media are described in the specification as including “carrier waves” and “light waves.” This rejection is traversed, based on the following remarks.

It is submitted that there is no such “tangible medium” test for patentability stated in 35 U.S.C. §101. The test is, generally, whether a tangible result is obtained, not whether or not the medium carrying the instructions that, when executed, produce the tangible results is considered tangible. Furthermore, PTO practice has considered transmission media (e.g., carrier waves) patentable subject matter for years, if not a decade. In fact, the Examination Guidelines For Computer-Related Inventions (March 28, 1996) indicate that “specific software embodied in a carrier wave” recites “specific software embodied on a computer-readable medium.”

Next, even if there was a legal basis for a tangible medium requirement, the types of transmission waves described in the specification are tangible. Claims 11-20 expressly state

that the media must be readable by a computer. Therefore, the media recited in these claims are necessarily perceivable and tangible media because they have to be read by a computer, and the fact that such wave types are computer-readable alone is dispositive evidence that the claimed wave types are tangible. That is, it is inherent that if a computer can read the medium, it is a tangible medium. Significantly, the medium is readable by a computer because of its physical properties, i.e., its 'physical substance'. Therefore, computer-readable media embodied in a carrier wave, where the wave is encoded with instructions that are readable by a computer, are both a statutory article of manufacture and a statutory product.

Furthermore, the idea that the various types of carrier waves described in the application are not tangible seems misguided. Simply because the human visual system may not be capable of physically *seeing* all such waves does not mean that they are intangible. If light waves and electromagnetic waves (e.g., radio and infrared) are produced and transmitted with enough energy and focus, a human could certainly physically *feel* the corresponding effect, as both types of waves are currently used, for example, in surgical procedures (e.g., LASIK eye surgery and laser-assisted uvulopalatoplasty, and radiofrequency-assisted uvulopalatoplasty) and military weapons.

Additionally, in view of the advances that have been made in a myriad of technologies that harness and utilize the underlying physical properties of waves, and the benefits to society from such advances, there is no apparent public policy reason for Congress or an administrative body to exclude from patentable subject matter carrier waves encoded by a machine with instructions that can be read by a machine. Further, there is no apparent public policy reason for classifying new and useful properties imparted onto forms of *energy* as unpatentable subject matter while classifying the same new and useful properties imparted onto forms of *matter* as patentable subject matter.

For the reasons set forth above, it is respectfully submitted that Claims 11-20 are not directed to non-statutory subject matter. However, to expedite prosecution, Claim 11 is amended herein to replace “computer-readable medium carrying ...” with “computer-readable medium storing ...” Reconsideration and withdrawal of the rejection of Claims 11-20 under 35 U.S.C. § 101 is requested.

(III) Claims 21-32

Claims 21-32 were rejected as allegedly directed to a system with recites only functional descriptive software and hence non-statutory. Claim 21 is amended herein to replace “[a] system comprising ...” with “[a] computer program product storing one or more sequences of instructions executable by a computer...” Reconsideration and withdrawal of the rejection of Claims 21-32 under 35 U.S.C. § 101 is requested.

THE REJECTIONS BASED ON THE PRIOR ART

Rejections under 35 U.S.C. §103(a)

(I) Claims 1, 3-5, 7, 8, 10, 11, 13-15, 17, 18, 20, 21, 26, 28, 30 and 32

Claims 1, 3-5, 7, 8, 10, 11, 13-15, 17, 18, 20, 21, 26, 28, 30 and 32 were rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over *Devine*.

Claim 1 is amended to recite the following:

receiving a request for a particular compound Web service that uses output from
at least a first Web service and a second Web service;
reading dependency information specific to the particular compound Web service,
wherein the dependency information specifies a sequence in which a
plurality of modules must be executed to perform the particular compound
Web service;

wherein properties of the plurality of modules are defined and set specifically for the particular compound Web service at service design time and persist through service runtime;

based on the dependency information, coordinating execution of the plurality of modules in the specified sequence, wherein the modules include at least a first service execution module having a module property that is set specifically for coordinating execution of the first Web service and a second service execution module having a module property that is set specifically for coordinating execution of the second Web service;

controlling execution of the particular compound Web service using the properties of the plurality of modules defined and set for the particular compound Web service; and

generating a result of the compound Web service based on the output from the first and second Web services

One fundamental distinction between the embodiment recited in Claim 1 and the teachings of *Devine* is that Claim 1 is explicitly in the context of Web services, whereas *Devine* is in the context of data retrieval, analysis, and reporting (RAR) services to interconnected computer users (para. [0002]). “Web services” are known to be a specific type of service (e.g., defined in the Web Service Definition Language (WSDL) and implemented to use specific protocols such as Simple Object Access Protocol (SOAP)) provided over the World Wide Web. Compound Web services can be developed using third party Web services, thereby leveraging third party functionality.

Generally, embodiments of the invention provides a framework for developing and deploying compound Web services based on two or more base Web services or applications. A compound Web service developer can use a set of invokable modules to control the execution of the base Web services that are constituent to a particular compound Web service, by setting

properties of the modules at compound service design time and by specifying execution dependencies between the “set” modules. At runtime, the execution processes involving the base Web services are based on the set module properties as well as the dependency specification for a particular compound Web service. Various embodiments comprise various modules, for non-limiting examples, service execution modules, input message splitter and output message merger modules, data transformation module.

The framework is flexible in that a Web service developer can readily aggregate existing Web services (e.g., even from third parties) without additional coding, by implementing the modules and dependency information specifically for execution of the particular compound Web service. Further, being module-based facilitates reuse and insulates developers from the complexities involved with interacting with multiple content/service sources and protocols. It is noteworthy that embodiments of the invention are directed to, generally, aggregating base Web services into a compound Web service and coordinating compound execution thereof.

Claim 1 is amended to clarify the context of Web services and to elaborate on the invokable modules and the dependency information, and centralized use thereof. *Devine* does not disclose the use of such (a) invokable modules and (b) dependency information, which can be set specifically for a particular compound Web service at design time, and that is used at runtime to coordinate the execution of and interaction between multiple base Web services of which the particular compound Web service is comprised. By contrast, *Devine* discloses a system for providing RAR services, in which data exchange mediation and processing is accomplished by one connected device per service, thereby eliminating coordination and processing by a central mediating server. See, e.g., para. [0018]. Furthermore, the RAR publishing and subscription service disclosed in *Devine* is such that an administrator controls who may belong to the network and what services each system user may access (para. [0023]).

Each of the foregoing features of *Devine* teaches away from the compound Web service framework embodied in Claim 1.

The Office Action appears to rely on the hard-coded functions of Devine (para. [0464]), which are selected to run a corresponding service (i.e., hard-coded RunAlarmService function assigned to run a user-defined Alarm service). These functions are generic or core services that are used to actually embody custom services. By contrast, the modules of Claim 1 are not *the* executable services, per se, as with *Devine*, but are for *coordinating and managing* execution of and interaction between multiple base Web services (which are separate from the modules), by way of set properties and module dependency information.

It is acknowledged that *Devine* mentions a mechanism for ensuring that constituent services comprising a composite service are executed in the correct order (para. [0510]). However, the *Devine* mechanism is a self-routing single message that includes the instructions for providing the composite service. This is different than using different execution modules (i.e., first and second service execution modules of Claim 1) that are each specifically set for coordinating execution of a *corresponding base Web service* constituent to the compound Web service.

Based on the foregoing, amended Claim 1 is shown to be patentable over the *Devine* reference. Claims 3-5, 7, 8 and 10 depend from Claim 1 and, therefore, are patentable over the cited references of record for at least the same reasons as Claim 1 from which they depend. Claim 11 is amended similarly to Claim 1 and, therefore, is patentable over the cited references of record for at least the same reasons as Claim 1. Claims 13-15, 17, 18 and 20 depend from Claim 11 and, therefore, are patentable over the cited references of record for at least the same reasons as Claim 11 from which they depend. Reconsideration and withdrawal of the rejection of Claims 1, 3-5, 7, 8, 10, 11, 13-15, 17, 18, 20 under 35 U.S.C. § 103(a) is requested.

Furthermore, each of the dependent claims recites at least one additional feature that makes it separately patentable over the cited references of record. Due to the fundamental distinctions between the independent claims and the teachings of *Devine* already described, discussion of these additional patentable features recited in the dependent claims is foregone at this time. However, the rejections of these dependent claims are collectively traversed and no statements of official notice, overarching allegations of obviousness, or allegations of well-known features that may be present in the Office Action are stipulated to or admitted as prior art features, and the right to separately argue such features in the future is not disclaimed.

Claim 21 recites modules that are configurable by setting one or more properties for controlling execution of corresponding particular compound Web services, similar to Claim 1. Claim 21 further recites a compound service execution adapter that coordinates execution of the various modules based on the dependency information and the module properties. The citations to *Devine* discuss compound services and scripts, but do not teach or fairly disclose the modules (as discussed above in reference to Claim 1) or the execution adapter that coordinates execution of such modules. By contrast, the scripts of *Devine* implement the actual services, i.e., the scripts when executed provide the services. The scripts are not used to coordinate multiple modules which, when executed, coordinate the execution of and interaction between multiple base Web services constituent to a compound Web service, e.g., data transformations, message splitting and merging, and conditional executions for running disparate base Web services that are aggregated into a compound Web service.

For at least the foregoing reasons, Claim 21 is patentable over the *Devine* reference. Claims 26, 28, 30 and 32 depend from Claim 21 are patentable over the reference of record for at least the same reasons as Claim 21 from which they depend. Reconsideration and

withdrawal of the rejection of Claims 21, 26, 28, 30 and 32 under 35 U.S.C. § 103(a) is requested.

Furthermore, each of the dependent claims recites at least one additional feature that makes it separately patentable over the cited references of record. Due to the fundamental distinctions between the independent claims and the teachings of *Devine* already described, discussion of these additional patentable features recited in the dependent claims is foregone at this time. However, the rejections of these dependent claims are collectively traversed and no statements of official notice, overarching allegations of obviousness, or allegations of well-known features that may be present in the Office Action are stipulated to or admitted as prior art features, and the right to separately argue such features in the future is not disclaimed.

(II) Claims 2, 9, 12, 19, 22 and 31

Claims 2, 9, 12, 19, 22 and 31 were rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over *Devine* in view of *Grau*.

Claims 2 and 9 depend from Claim 1; Claims 12 and 19 depend from Claim 11; and Claims 22 and 31 depend from Claim 21. It is shown above that *Devine* is deficient in its teachings regarding each of independent Claims 1, 11 and 21. Furthermore, the teachings of *Grau* do not cure the deficiencies in the teachings of *Devine*. Thus, no possible combination of *Devine* and *Grau* would make obvious the subject matter of these respective claims.

Consequently, each of Claims 2, 9, 12, 19, 22 and 31 is patentable over the cited references of record for at least the same reasons as the independent claim from which it depends.

Reconsideration and withdrawal of the rejection of Claims 2, 9, 12, 19, 22 and 31 under 35 U.S.C. § 103(a) is requested.

(III) Claims 6, 16, 23-25, 27 and 29

Claims 6, 16, 23-25, 27 and 29 were rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over *Devine* in view of *Meltzer*.

Claim 6 depends from Claim 1; Claim 16 depends from Claim 11; and Claims 23-25, 27 and 29 depend from Claim 21. It is shown above that *Devine* is deficient in its teachings regarding each of independent Claims 1, 11 and 21. Furthermore, the teachings of *Meltzer* do not cure the deficiencies in the teachings of *Devine*. Thus, no possible combination of *Devine* and *Meltzer* would make obvious the subject matter of these respective claims. Consequently, each of Claims 6, 16, 23-25, 27 and 29 is patentable over the cited references of record for at least the same reasons as the independent claim from which it depends. Reconsideration and withdrawal of the rejection of Claims 6, 16, 23-25, 27 and 29 under 35 U.S.C. § 103(a) is requested.

Furthermore, each of the dependent claims recites at least one additional feature that makes it separately patentable over the cited references of record. Due to the fundamental distinctions between the independent claims and the teachings of *Devine* already described, discussion of these additional patentable features recited in the dependent claims is foregone at this time beyond the extent presented below. However, the rejections of these dependent claims are collectively traversed and no statements of official notice, overarching allegations of obviousness, or allegations of well-known features that may be present in the Office Action are stipulated to or admitted as prior art features, and the right to separately argue such features in the future is not disclaimed.

For example, regarding Claim 6, the *Meltzer* discussion of transforming XML data into Java objects is not a fair teaching or suggestion of an transformation module that is specifically set for transforming data between different data structures used by corresponding base Web services that are aggregated to form a compound Web service, in the manner recited in the

embodiment of Claim 6. Additionally, neither *Devine* nor *Metzler* describes or suggests *how* the *Metzler* transformation could be implemented for use such as recited in Claims 1 and 6. For this additional reason, Claims 6 and 16 are patentable over the references of record.

For another example, regarding Claim 25, *Devine* and *Metzler* do not fairly teach or suggest the use of an XSLT stylesheet to transform messages between modules and/or Web services. By contrast, *Metzler* discusses creating an XSL stylesheet for displaying XML documents.

(IV) Claim 33

Claim 33 was rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over *Devine* in view of *Grau* further in view of *Meltzer*.

The rejection of Claim 33 is based on the same rationale as the rejections of Claims 1, 2 and 6-9. Therefore, the reasons presented herein as to why Claims 1, 2 and 6-9 are patentable over the cited references of record are equally applicable to Claim 33. Reconsideration and withdrawal of the rejection of Claim 33 under 35 U.S.C. § 103(a) is requested.

NEW CLAIMS

New Claims 34 and 35 are added to the application to claim subject matter disclosed in the application as originally filed. Hence, no new matter is introduced in the application by these new claims. Claim 34 recites an embodiment emphasizing the type of Web service involved (i.e., defined in WSDL), and Claim 35 recites an embodiment emphasizing a particular use context in which one party can aggregate Web services from other parties into a compound Web service. Neither of the foregoing features is taught or suggested in any system disclosed in the cited references of record.

CONCLUSION

For the reasons set forth above, it is respectfully submitted that all of the pending claims (1-35) are now in condition for allowance. Therefore, the issuance of a formal Notice of Allowance is believed next in order, and that action is most earnestly solicited.

The Examiner is respectfully requested to contact the undersigned by telephone if it is believed that such contact would further the examination of the present application.

Please charge any shortages or credit any overages to Deposit Account No. 50-1302.

Respectfully submitted,

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